

Durham Research Online

Deposited in DRO:

05 September 2016

Version of attached file:

Accepted Version

Peer-review status of attached file:

Peer-reviewed

Citation for published item:

Moore, Gerald (2017) 'On the origin of Aisthesis by means of artificial selection ; or, the preservation of favored traces in the struggle for existence.', *Boundary 2.*, 44 (1). pp. 191-212.

Further information on publisher's website:

<https://doi.org/10.1215/01903659-3725941>

Publisher's copyright statement:

Additional information:

Use policy

The full-text may be used and/or reproduced, and given to third parties in any format or medium, without prior permission or charge, for personal research or study, educational, or not-for-profit purposes provided that:

- a full bibliographic reference is made to the original source
- a [link](#) is made to the metadata record in DRO
- the full-text is not changed in any way

The full-text must not be sold in any format or medium without the formal permission of the copyright holders.

Please consult the [full DRO policy](#) for further details.

TITLE: On the Origin of *Aisthesis* by Means of Artificial Selection, or the Preservation of Favoured Traces in the Struggle for Existence

AUTHOR: Gerald Moore

ABSTRACT: Much is made of Darwin's concept of natural selection, but Bernard Stiegler has developed a theory of artificial selection that is arguably every bit as important for an understanding of human life, and the life of the mind and aesthetics, in particular. Building on work by the paleo-anthropologist, André Leroi-Gourhan, Stiegler argues that humans evolve biologically insofar as they are animals, but only become human through technics. Through tools, we are able to take hold of our own future by reconstructing environments to which we are maladapted and preserving values that we choose to privilege over and above adaptive fitness. These tools also transform the field of our experience, de- and refunctionalizing our biological organs in a way that enables the body to interpret and be interpreted differently. Perhaps the most prominent example of this transformation of the body by technics is to be found in the unconscious, which comes into existence through the reorganization of the plastic brain by cultural systems of tool-use. Our aesthetic preferences are not simply biologically-hardwired, but stem from our unconscious inheritance of the culturally transmitted and artificially selected codes of symbolic order.

BIOSKETCH: Gerald Moore is Lecturer in French in the School of Modern Languages and Cultures, Durham University, and also sits on the Conseil d'Administration of Ars Industrialis. He is author of *Politics of the Gift* (Edinburgh University Press, 2011) and coeditor, with Christina Howells, of *Stiegler and Technics* (Edinburgh University Press, 2013). He is also working on

a monograph on Stiegler, *Bernard Stiegler: Philosophy in the Age of Technology*

(Polity, forthcoming).

KEYWORDS: artificial selection, coevolution, cultural transmission, Darwin, *différance*, evolutionary aesthetics, Leroi-Gourhan, Stiegler, technics, trauma

But if variations useful to any organic being ever do occur, assuredly individuals thus characterized will have the best chance of being preserved in the struggle for life; and from the strong principle of inheritance, these will tend to produce offspring similarly characterized. This principle of preservation, I have called . . . Natural Selection.

Charles Darwin¹

The passage of life from the struggle for the satisfaction of need, or subsistence, to life as existence, revolving around objects of worship, is made possible above all by the fact that with the process of externalization, “selection pressure” is refocused around the capacities of the genus *Homo* to invent or make use of artificial organs . . . and for that reason we can no longer strictly speak of “natural selection”: it is a matter of artificial selection in which art, which is to say technics, and arts and crafts in the broadest sense, come to the fore.

Bernard Stiegler²

Jacques Derrida’s concept of *différance* captures the way in which the meaning of a sign or trace is constitutively open to being rewritten in the future, when subsequent interpretations retroactively transform our understanding of its earlier instances. Several critics, perhaps most prominently Slavoj Žižek,³ have suggested that the logic of *différance* is thus also that of the random variation in natural selection, where a mutation in genetic replication amounts to a repetition of difference that will retroactively be interpreted as “fit” or “maladaptive.” Bernard Stiegler has gone further still, differentiating between two regimes of evolutionary

différance, pertaining to *natural* and *artificial* selection, respectively. When a foot mutates into—or is iterated, repeated as—a hand, it is retroactively reinterpreted as a proto-organ for grasping that adapted its bearer for survival. And when a tool is added to a hand, the hand, too, is reinterpreted, in what Leroi-Gourhan will call a “liberation” and Stiegler a “reinvention” through technics. The tool that supplements the hand also reinvents it, with the organ for grasping re-emerging as an organ for hammering, carving or writing. The transformation of the field of experience means that subjectivity is also reinvented. In being taught to use a tool, we are also taught to experience, by internalizing a new horizon of possibilities that it opens up: “feeling [*le sentir*] is *tekhnē* from the outset,”⁴ as Stiegler puts it. This is the *différance* of artificial selection, where the *who* and the *what*, the subject and the tool, continually retrace one another; where the tool, in other words, produces a subject through the process of creating its objects. In the second volume of *De la misère symbolique* (*Symbolic Misery*), this is theorized in terms of the effect of the tool on the brain: “It is therefore in its relations to prostheses that the human brain, like the human hand and every other human organ, is perpetually undergoing functional redefinition” (*MS2*, 229). The claim is reformulated in Stiegler’s more recent work: “the hand writes directly into the brain,”⁵ or: our prostheses reorganize the sensory cortex.

The notion of functional redefinition, of the “refunctionalization and defunctionalization” of organs by technics, serves to make sense of Stiegler’s assertion that technical evolution, meaning the reorganization of the living by the dead, organized, inorganic matter of technics, amounts to a “new organization of *différance*, a *différance* of *différance*” (*TT1*, 178/186).⁶ Already a product of the *différance*, or variation, of natural selection, liable to further mutations that might

see it interpreted differently in the future, the physiological organ is opened onto a second kind of *différance*, in which its function is deferred into the prosthesis. The deferral brings with it a corresponding differentiation of experience, with feeling and moreover meaning and aesthetic value produced when physical sensation enters into a circuit with the technics that supplement the body; when the use of a tool “confers its sense on that which is sensed [*confère son sens au senti*] by inscribing *aisthesis* within *semiosis*, within a symbolic and logical horizon” (*MS2*, 62). It is this technical inscription of aesthetics that gives rise to the life of the mind, or spirit, the “noetic soul” whose existence consists, over and above survival of the fittest, in the transgression of biological patterns of behavior.

Like the physiological organ, the technical organ is susceptible to future change, but unlike the naked hand, whose mutation in genetic replication is always unforeseen, the hand refunctionalized by the tool can anticipate its future forms and actively bring them into existence. Through artificial selection, we cease to be mere products of our genetic history and become the architects of our own future, inventing an agency that is wrested away from genetics. It is in this sense, Stiegler claims, that technical evolution marks a break with evolution by natural selection. The history of humanity will thus be a “history of the supplement,”⁷ meaning the history of our externalization, or deferral, into the technical prostheses through which we repeatedly invent ourselves. This history is also a “genealogy of the sensible” (*MS2*, 79), of the transformation, or “sublimation,” of sensory stimulus (“l’âme sensitive”) into shared and socially regulated meaning (“le sensible”), via the construction of a technical-symbolic, aesthetic, social order (*MS2*, 70, 198). In line with what he calls “general organology,” meaning not just the physiological, but the technical organs and

social organizations in which human life consists, Stiegler undertakes to analyze how different (physiological, technical) organs across human and pre-human history have generated the originating conditions of different modes of experience (MS2, 188). This genealogy is split into two overlapping parts, corresponding to two kinds of technical evolution in Stiegler's work, only the second of which fully captures his interest in the term. The first of these, developed in his early works on André Leroi-Gourhan, pertains to the "paleo- and archaeo-analysis of hominization" (MS2, 188), or the corticalization of the so-called anatomically modern human, which results from the co-evolution of brain and tool. The second kind of technical evolution explains how our physiological organs are continually de- and re-functionalized by the accumulated technical organs and symbolic order of culture, which organize subjectivity via the synaptic circuitry of the brain, without the effects ever passing into our gene pool and phenotype. The regulatory social system of culture thus consists in a kind of externalized memory or technical unconscious that conditions *what* and *how* we experience—and which therefore lies at the heart of both our prevailing aesthetic codes and their very opposite, namely the anti-stereotypical, frequently traumatic, encounter that we find in art.

Function-shift and "general organology"

One of the most powerful early criticisms leveled at Darwin's theory of natural selection was the question of what St. George Mivart, in *On the Genesis of Species* (1871), termed "the incompetency of natural selection."⁸ The phrase

alludes to an issue over the seemingly dubious adaptive function of proto-organs, or the question of how notionally unfinished organs could ever evolve to the point where they would serve a purpose. If, as Darwin claimed, adaptive traits were the result of cumulative series of minor and moreover contingent changes, then every minor mutation on the way to, say, the gradual evolution of a wing would also, by that logic, have to confer an adaptive advantage. But, as Stephen Jay Gould would later pose the problem, what kind of advantage is to be found in just “2 per cent of a wing,”⁹ which would by no means suffice for flight? Darwin himself anticipated this problem, noting that “in considering transitions of organs, it is so important to bear in mind the probability of conversion from one function to another.”¹⁰ So, too, did Friedrich Nietzsche, who famously observed that an organ’s “function” is hit upon only retroactively, once interpretation has revealed the uses to which it can be put. “The whole history of a ‘thing,’ an organ, a tradition can to this extent be a continuous chain of signs, continually revealing new interpretations and adaptations, the causes of which need not be connected even amongst themselves.”¹¹ The answer, in other words, is that the function of an earlier stage of an evolving organ need not be continuous with its subsequent forms; nor need it have served any purpose at all. The protean wing was not initially a diminished, imperfect organ of flight (a glider, or stabilizer), but a mechanism for thermoregulation, the maintenance of body temperature. The traditional evolutionary term for this kind of function-shift is “preadaptation,” meaning an adaptation that lends itself to being refunctionalized as something else. Since preadaptation carries connotations of both Lamarckian teleology and the neo-Darwinist (“adaptationist”) idea that *all* variation in nature *must* bear some evolutionary advantage, Gould suggests the alternative and “more inclusive term

‘exaptation’—for any organ not evolved under natural selection for its current use—either because it performed a different function in ancestors (classical preadaptation) or because it represented a non-functional part available for later co-optation.”¹²

Bernard Stiegler does not himself refer to exaptation, nor to preadaptation for that matter, but the function-shift of physiological—and social—organs is central to his concerns, particularly insofar, he argues, as function-shifts can be induced by technics. He writes of “a defunctionalization and refunctionalization of the living organism, brought about by the advent of the dead organs that are technical objects,” a de- and refunctionalization of physiological organs by our technical prostheses (*MS2*, 221). The process of de- and re-functionalization becomes crucial to his assertion of a rupture between the evolution by natural selection of man as animal and the artificial, technical selection that characterizes the technical evolution of human mind, or spirit. In *Symbolic Misery, 2: The Catastrophe of the Sensible* (2005), the back half of the work on aesthetics that bridges the first three volumes of *Technics and Time* and the *Disbelief and Discredit* series, Stiegler expands his earlier formulation of technical evolution as “the pursuit of life by means other than life” (*TT1*, 17/31). Borrowing from a well-known formulation of French inheritance law, also cited by Marx in the preface to *Capital*, he argues that technical evolution pertains to the ways in which “the dead takes hold of the living,” *le mort saisit le vif* (*MS2*, 218 n.1).¹³ The phrase refers, in this instance, to the co-optation, or reinterpretation, of biological organs by the “organized, inorganic matter” of technics. Stiegler christens the study of these interactions “general organology,” meaning a logic that encompasses not just our vital, sensory organs, but the non-living technical organs that transform their

function, and also the social organizations that determine which refunctionalizing technics we adopt: “organology as the co-individuation of *living* organs, *artificial* organs and the *organizations* that link them together, in such a way that vital organs are defunctionalized in relation to the individuation of life” (*MS2*, 222).

The “general,” here, is taken from the early Derrida, who frequently deploys the qualification “en général” to designate being “prior to the distinction between man and animal, and even before the distinction between the living and the non-living.”¹⁴ Stiegler reprises it in his own early work, referring to “life in general” and “the history of life in general,” both of which are given as names for the operation of *différance*, in which the prosthesis retraces and thereby reinvents the (“specific,” or species-related, “zoological”) body that it supplements (*TT1*, 136-9/148-51). General organology thus captures the idea that the organs of human life are not restricted to the physiological organs of *Homo sapiens sapiens* as a biological species. They also encompass the external, technical organs and social organizations whose internalization gives rise to the life of the mind, or spirit:

General organology has the vocation of studying . . . the physiological organs of the body in relation to artefactual organs and the organizations that make up the body of society, and the characteristics of these organs insofar as they set to work the retentional apparatuses that operate [artificial] selection. . . . General organology is therefore the study of the dead and the living. (*MS2*, 216-18)

Where a specific, or species-based, organology would study only biological forms of negentropy, general organology takes as its object the technical organs of

human society. These “artefactual” organs serve as the bases of the artificial, as opposed to natural, selection in which human life consists.

Drawing on Gilles Deleuze’s concept of the quasi-cause, from *Logic of Sense*, Stiegler describes them as being “quasi-causal,” constituting “a way out of ‘material’ causality, in the common sense of the term.”¹⁵ This clearly does not mean that technical objects are not material, and should rather be taken as a claim about the way in which technics create horizons of expectation from which our actions will be suspended. By enabling us to break with the retroactively conferred “fitness” of adaptation, by enabling us to overcome maladaptation through the transformation of our environment, technics enable us to create—and desire—our own future. They lift us out of the mere imperative to survive and elevate life into “a *struggle for existence*,” which is to say, a struggle that goes beyond the mere “subsistence” of resisting death.¹⁶ Existence, in this respect, consists in the way that tools take us out (ex-) of our inhesion in biology and open us onto alternative possibilities of being. We ex-ist because we con-sist in technics, suspended between our bodies and our tools, between our technical heritage and the visions of a world that this heritage enables us to project.

Coevolution and epiphylogenesis

Writing in the post-war period, André Leroi-Gourhan argued that humans’ evolutionary niche consists in our ability continually to reinvent ourselves through technics, and thereby overcome our absence of anatomical specialization (*GSI*, 117/168).¹⁷ For Leroi-Gourhan, technics marks a continuation of evolution by

other means, with different techniques amounting to mutations external to the biological organism, for whose deficiencies they substitute. He suggested that society is made possible by the externalization of movement, displaced into animals and machines that we operate through the organs that would once themselves have done the moving. "The hand-tool could be seen as the instrument of liberation from the genetic constraints by which an animal's organic implements are tied to the zoological species" (*GS2*, 227/21). Through technics, we free up our organs for alternative uses.

Yet technology is only a continuation, or a different variety, of the liberations already found throughout the history of evolution. Our ability to reinvent ourselves through tool-use presupposes a series of "successive 'liberations'" of anatomy that paved the way for bodies to be interpreted differently (*GS1*, 117/167), evolutionary mutations that made possible the technical transformation of our ancestors' limbs and sensory organs. Leroi-Gourhan undertook a painstaking comparison of the gradual anatomical changes that would (contingently) culminate in the liberated skeletal motricity of humans, beginning with the flattening of the foot and upright walking, which coincide with the liberation of the hand and of a skull that was hitherto restricted to limited movements at the top of the vertebral column (*GS2*, 117/167). Bipedalism means that the hand is defunctionalized from its previous task of locomotion and refunctionalized for "prehension" (*GS2*, 240-2/41). The new uses for which it is freed include not just reaching for food and, ultimately, the manipulation of tools, but also the grooming and interpersonal contact that will prove vital to human socialization (*GS2*, 239/38). The "liberation of the forehead" comprises the disappearance of the brow ridge, and the flattening of the face through the

thinning of the chin, jawbone and teeth (*GSI*, 71, 75/102, 108). And with the grasping hand now preferred to the outstretched neck, the jaw, tongue and lips—still accompanied by hand gestures—are liberated for speech (*GSI*, 112-14/161-2).

These preadaptations of the hand and mouth for technics and speech, respectively, would, in time, give rise to further adaptations, including “special adaptations for cross-generational learning,” such as genes that allow flint-knapping to be learned reliably and at low risk of injury to the learner.¹⁸ In this respect, anatomy is honed for purpose by what Stiegler, following Leroi-Gourhan, terms the “co-evolution” of tool and brain. Evolutionary theory more generally calls this “gene-culture coevolution” and it describes situations where a built cultural environment facilitates the survival and selection of some genes over others, for example, by affording protection to individuals who may otherwise have fallen foul of the survival of the fittest, or by conferring selective advantage on those members of society better preadapted to adopt its toolsets. For Stiegler, coevolution already marks a shift away from natural selection. Humans’ ability to transform their environments through technics results in “*relaxing the effects of selection pressure and in suspending natural selection as the law of the struggle for life, and even suspending the biological evolution of the human species, . . . displacing the evolutionary process into artificial organs.*”¹⁹

Our constitution through artificial organs nonetheless goes far beyond interfering in the process of natural selection. Gene-culture coevolution prevailed as genetic adaptations for tool-use were selected and passed on to subsequent generations, until the point where *Homo sapiens sapiens* became the only remaining extant form of the genus *Homo*. At this point, though still ongoing over the decelerating course of evolutionary time, coevolution recedes into the

background and a second type of technical evolution comes to the fore (*MS2*, 239-30). This is the evolution of technical and social systems that Stiegler labels epiphylogenesis, meaning the transmission of acquired experience from generation to generation via the cultural practices that become sedimented in and around technical objects. By adopting a culture's tools and immersing ourselves in the experience and possibilities to which they give access, we inherit our ancestors' knowledge without it having had to pass into the "phylogeny," or genetic history, of the species (hence the prefix "epi-phylogenesis," indicating "outside" or "in addition" to the species line). And in inheriting their acquired experience, we also inherit their way of interpreting the world. The "genealogy of the sensible" thus refers not only to the evolutionary-biological architecture of our sensory organs, but also to the refunctionalization of these organs by technics that reinvent the field of experience. Irrespective of their anatomical and broad genetic identity, as Stiegler puts it, "a foot that presses down on an accelerator pedal and essentially rotates along these lines is no longer, organologically speaking, which is to say, insofar as it is an organ inscribed within the circuit of a desire, the same foot as that of a bushman who runs in the savannah," for the simple reason that "such organs no longer economize libido in the same manner" (*MS2*, 227).

Anatomically, the body has remained the same from the Middle Paleolithic, through the Neolithic Revolution in agriculture, the proto-writing systems of the Bronze Age, and the advent of industrial machinery up until our present, so-called Digital Age. But this period encompasses entire histories of the multiform ways in which human bodies have been de- and refunctionalized by technics, their energies differently harnessed and ("libidinally") invested in the construction of societies. From the slower, more patient expectations of cultures in which letter-

writing and low-intensity farming predominate, to our contemporary obsession with the immediate gratification offered by high-yield instant returns and constant availability, different tools give rise to radically different experiences of time, desire, and attention, by standing us in varying affective relation to the possible futures onto which we are opened up through their adoption. The root of these differences, Stiegler suggests, is to be found in the effect of technics on the neurally-plastic brain, whose circuitry is continually reorganized by the prosthetic conditioning of the body.

The brain occupies a privileged place in the theory of general organology, albeit one that is under-developed at present.²⁰ In a line of thinking developed in the forthcoming *Technics and Time, 4 (Symboles et diabolos*, previewed in the 2012-13 filmed seminar series on Stiegler's pharmakon.fr), the closing chapters of *The Catastrophe of the Sensible* propose that the principal organ of the central nervous system "must be thought as the organ of relations between the dead and the living" (*MS2*, 218), as the nexus through which the body undergoes its de- and refunctionalization through technics (*MS2*, 229). The idea that subjectivity consists in an internalization of our externalization in technics has been central to Stiegler's concerns since the first volume of *Technics and Time, The Fault of Epimetheus*, and his current interests lie in an explicit return to this opening theme. The earlier work articulates the process of simultaneous externalization and internalization as the movement of *différance* (or rather, of the "*différance* of *différance*"), in which the *who* and the *what* repeatedly retrace one another, with the subject producing the technical object, which then reinvents the subject, and so on (*TTI*, 176-8/184-6). The recent *Pharmacologie du Front National* (2013) clarifies what is at stake in this reinvention, as Stiegler draws on the

neuroscientists Maryanne Wolf and Stanislas Dehaene to argue that reading consists in the recycling (or “exaptation”) of neural circuitry that originally evolved for something else; and that the ways in which the brain is refunctionalized by technics vary across time and space. The transition from oral to written culture coinciding with the invention of the alphabet, for instance, “was translated by a reorganization of the cortex, which is to say, by the establishment of synaptogenetic processes that *literally* inscribed the letter *into* the cerebral organ”: our prostheses write directly into the brain.²¹ His current projects further develop this claim via the work of figures including Joseph LeDoux, on “synaptic selfhood” and the sense in which our “plastic” neural structures are “modifiable by experience,”²² and the psychologist Merlin Donald, who has supplemented evolutionary biology with an account of how culture restructures the “fundamental neurological organization” of the brain, “literally reconfiguring the sensory cortex.”²³

This neuroscientific turn might suggest that Stiegler’s work is converging with that of another major figure in contemporary French philosophy, namely Catherine Malabou, who engages with neural plasticity as part of a broader program of reconciling psychoanalysis with contemporary neurology. Focusing specifically on the relation of cerebral function to the experience of trauma, Malabou argues that the experience of traumatic shock consists in a disorganization of affect, an emotional disengagement that can be traced to the destruction of the neural synaptic networks in which our conditioned behaviors are embedded.²⁴ In Stieglerian terms, that would seem to equate trauma with a kind of extreme culture shock, in which our internalization of the cultural memory externalized in technics breaks down. The undoing of the external symbolic

coordinates of identity would thus coincide with the loss of the affective experience that these coordinates organize. In Stiegler's account, however, trauma pertains less to a loss of affect than to a reawakening thereof, and it needs to be understood in the context of a theory of general organology that traces the origins of the unconscious to technics. By positing the unconscious as an organ produced through the de- and re-functionalization of the body through technics—a result of artificial and not natural selection—he moreover shows it to be deeply bound up with aesthetic experience.

“The artefactual organization of the sensible”

Natural Selection has been the main but not exclusive means of modification.

Charles Darwin²⁵

Perhaps the most dramatic example Stiegler gives of an epiphylogenetic refunctionalization of the body is found in his account of the unconscious, which is theorized not as a product of biological evolution, but rather as technical in origin, pertaining to the ways in which experience is conditioned by the prostheses through which the world is made sensible to us. His theory of the technical unconscious reworks the unconscious mind as a repository of culturally inculcated patterns of experience passed down through the generations, with trauma amounting to exposure to forms of experience to which our bodies have not been habituated. In saying this, Stiegler provides an alternative to the much-

criticized Freudian view, in which the traumas of our ancestors appear to be inherited and endured in the present through a process of biological transmission.²⁶

To locate the origin of the unconscious, Stiegler takes us back to the advent of bipedalism, and suggests that there was more going on than just the liberation of the hand for tool-use. Upright walking coincided with another function-shift in our hominid ancestors' sensory organs, "an *organic repression* at the origin of repression in general" (MS2, 200). In the penultimate chapter of *Symbolic Misery*, entitled "The Repression of Freud", Stiegler recounts the details of an early letter from Freud to his mentor, Wilhelm Fliess, in November 1897, in which the psychoanalyst's observation of his bottom-sniffing dog leads him to hypothesize a refunctionalization of the sensory organs as an additional consequence of humans' shift to bipedalism: "upright walking, nose raised from the ground, at the same time a number of formerly interesting sensations attached to the earth become repulsive."²⁷ When the nose had been level with the anus, Freud muses, anal-olfactory stimulation — with its capacity for disease detection — would have been a notable indicator of sexual attraction. The shift to upright walking entailed a libidinal decathexis, or defunctionalization, of both the nose and the anus on which it was hitherto trained, with the brunt of detecting attraction thenceforth falling on the eyes, which are accordingly refunctionalized. This idea is carried over into a footnote in *Civilization and Its Discontents*, where Freud further speculates that the previously eroticized odors of excreta and female menstruation become an object of taboo and "organic repression." The genitals, too, now give rise to shame, and so are covered up with clothing.²⁸

Stiegler reads this as the “defunctionalization of the sense of smell” and moreover as “a defunctionalization of the *sexual* . . . such as it is formed in *animality*” (MS2, 200, 206-7). But while crediting Freud for recognizing the significance of organological function-shift, he is nonetheless critical of the psychoanalyst’s failure to link the ensuing refunctionalization of the eye to a technicization of sexuality, hence also to a process that inaugurates “a *new epoch of aesthetics in the long history of the sensibility of the sexually differentiated animal*” (MS2, 205). His contention, in other words, is that aesthetics begins when technics are offered up to sight; when the odors of animal sexuality give way to the “artefactualization of the beautiful” (MS2, 210). As Stiegler shows by turning to Darwin via Leroi-Gourhan, the beautiful, technical artefacts in question are the clothes and other stylings through which humans differentiate themselves from one another.

In Freud’s account of human nature, the constitutive role of technics in the invention of the human “has been repressed,” just as it has throughout the history of Western metaphysics (MS2, 228). Perhaps surprisingly, the same cannot so easily be said of Darwin. Endorsing the idea that “clothes were first made for ornament and not for warmth,”²⁹ the closing chapters of *The Descent of Man* (1871) document the various ways in which humans, irrespective of tribe and ethnicity, use prostheses as supplementary secondary sexual characteristics. Darwin describes how sexual selection, meaning the struggle to procure a mate for the purposes of reproduction, becomes inseparable from “artificial selection.” In *On the Origin of Species*, this phrase was employed to denote the selective breeding of domesticated animals, but it has since acquired the sense of using “artificial means” like hair sculpting, bodily adornment, modification and

mutilation to heighten attractiveness.³⁰ Stiegler reads Darwin as recognizing that desire is a product of culture (“the different races of man differ in their taste for the beautiful”),³¹ and as open to the prospect that criteria determining what we desire are transmitted across generations by a process other than natural selection.

The first move in this direction is made, once again, by Leroi-Gourhan, who writes, in the second volume of the monumental *Gesture and Speech* (1964), that “the aesthetics of clothing and adornment, despite its wholly artificial character, is one of the biological traits of the human species most profoundly linked to the zoological world” (*GS2*, 351/189). In an insight that proves central to Stiegler, he traces the emergence of “aesthetic sensibility” from forms and behaviors found in nature through to the shared symbolic codes around which human communities are organized. Anticipating the theory of de- and refunctionalization, Léroï-Gourhan suggests that aesthetics originates in “biological properties common to all living organisms,” but attains its fullest sense in the extension of biology into technics that condition bodily rhythms and establish norms for the distribution of bodies within a given society (*GS2*, 271-2/82-3). The wing markings of a butterfly function as signifiers of both natural and sexual selection, warding off predators and attracting mates, and thus

belong to the uncertain world of style even if, in Darwinian terms, they perform a protective function for a certain length of time in the history of the species. Human decoration

—by contrast—

only confirms the general rule of substitution of the ethnic group for the species; the same phenomena can be observed in the persistence of marks expressing the personality of a group. (*GS2*, 300/122)

The artificial selections of human communities may facilitate survival, but they also, crucially, give rise to traditions that bind members of a society together, and thus furnish the rules of their transgenerational belonging. The prosthetic style of an ethnic group serves to establish its collective identity by laying out “values and rhythms” of the community (*GS2*, 278/93). It also, and moreover, communicates the hierarchy and internal differences of the group, via significations of rank or wealth that persist through the ages. Be they educational, military, religious or economic, the social organs of society participate in the “organization of the sensible” (*MS2*, 188), constructing a body politic schooled in interpreting the aesthetic, symbolic codes of social order. In re- and defunctionalizing the bodies of its members, by teaching them to read and write, for example, the organizations of this technical-symbolic order train us to decipher selected aesthetic codes (*MS2*, 70-4, 212-13). Every technical object and institutionalized body of knowledge is a “trace” of society’s acquired experience, an externalized memory support incorporating the generations of accumulated skill that went into their construction.

Aesthetic awakening

Social organization consists in “selecting from among these traces that which should be internalized by the body in the construction of a social body [*dans le*

faire-corps social]" (MS2, 232). This, Stiegler contends, is the origin of what

Freud called the superego, the moral conscience that comes from the

internalization of authority. He links it to the effect on the brain of the ongoing

functional redefinition of physiological organs by technics (MS2, 229):

As the seat of the unconscious . . . the brain relates to other organs and partial zones of the body in general through the mediation of technical objects that are external to the body. What is more, this relation to technical objects is subject to, or rather inscribed in, a relation of social organizations . . . in which are inscribed the rules of a superego that the brain can only internalize. (MS2, 225)

When we adopt the institutions and prostheses of a culture as our own, they take hold of the body in a way that opens us up to new possibilities of feeling (*le sentir*), while also repressing others (MS2, 193). Through the accumulated knowledge sedimented in technics, we internalize a past that we never actually lived. Some of these artificial selections become engrained as second nature, to the point where, like Nietzsche's coin of truth, they lose their "sensuous power" of transformation.³² Their repeated circulation nonetheless conditions stereotypical patterns of social behavior, serving to reinscribe a horizon of expectation that governs how and what a society knowingly or unconsciously experiences. These "stereotypical" elements of technico-cultural memory, whose adoption and internalization reinforces the habitual organization of experience, are to be differentiated from those that "overwhelm this organization" (MS2, 235). Stiegler terms the latter "traumatypes," and suggests that even trauma pertains to this kind

of de- and refunctionalization of our brain and sensory organs. As with all “noetic,” “sensible,” as opposed to merely “sensory,” experience, it results from the conditioning of our anatomical apparatus. We have to be sensitized into experiencing an event as traumatic. The “return of the repressed” consists in a reactivation of forgotten circuits of signification, where an anxiety endured by ancestors, and transmitted through history via the organization of culture, is unconsciously inherited in the present. Whether a brush with death or a terrifying intellectual encounter, we experience trauma as traumatic to the extent that an event provokes a resurfacing of previously internalized traumatypes, buried deep within us and prevented from becoming conscious by the masking effect of our established patterns of thought. The violence of the awakening shakes us out of our prevailing stereotypes (*MS2*, 235-9).

Yet trauma, according to Stiegler, is not purely negative. Recalling the language of Leroi-Gourhan, he describes the overturning of an existing organization of the sensible in terms of “liberation”: “The liberation of the unexpected is therefore the liberation of a repressed expectation” (*MS2*, 236). The traumatic breaking with stereotype is moreover identified with philosophy—and also with the work of art, both of which are reconceived around the idea of the “anamnesis,” or recollection, that Stiegler takes to be at the heart of philosophy’s “repressed” and “unthought” encounter with technics (*TTI*, ix/11). Balanced on the sublime precipice between ordeal and wonder, philosophy and art consist in the unsettling revelation of an unknown past that haunts us; in the ghostly return of a cultural memory one never consciously lived, but which is retraced in the opening up of new possibilities of experience. The epiphany is less an exhaustive

moment of recognition than a surprised seizing upon of that which exceeds our grasp:

Comprehension is reduction to the same, and surprehension is the experience of the other in the same—which is to say, the experience of the singularity of the sensible.

This is the experience of meaning [*signifiante*], where that which is experienced . . . suddenly comes to explode the expectations settled upon by stereotypical secondary retentions, and . . . like all spiritual works opens a way for the traumatypical power of repressed secondary retentions to return to the surface, thereby constituting what one might call a Proust-like moment of anamnesis: the return of an ancient traumatype, coming back [*revenant*] like a phantom, a spirit, or a punchline [*un mot d'esprit*] . . .

Yet this “resurfacing” of a traumatype, which always arises simultaneously from preindividual depths [*un fonds pre-individuel*] proper to and lived by one’s self (secondary retentions and protentions), from a preindividual fund [*un fonds pre-individuel*] inherited from one’s ancestors but which one never lived oneself (proto-protentions and proto-retentions), and from a fund common to though never fully lived by all desiring (human) creatures, . . . a traumatypical resurfacing of this kind is only ever produced under conditions constituted by the historical state of . . . the de- and refunctionalization that tertiary memory presupposes and enables. (MS2, 237-8)

The passage is shot through with the language of Husserlian phenomenology, in which “secondary retention”—as distinct from the “primary retention” of a moment that has just passed—refers to consciously reproducible memories. These memories structure our internal consciousness of time, including not just the past that we retain but also the future expectations, or “protentions,” that they habituate us into projecting.³³ Stiegler’s contention is that secondary retentions are embedded in the external (“tertiary”) memory supports of technics, with unconscious memories of an unlived past inscribed in the body over the course of cultural conditioning, through the refunctionalization of the sensory cortex by the inherited technics that we adopt as our own. In the experience of anamnesis, the body enters into relation with prostheses that tap into our artefactual history, firing neurons along synapses hitherto pushed to the back of the mind, stimulating parts of the cortex weakened by disuse. If we encounter the return of the repressed in the work of art, it is because it disorganizes our habitual rhythms of thought and experience, relaxing the protensions that structure our expectations, and which would otherwise reign in our ability to envisage futures that differ from the present.

The description of this kind of awakening as traumatic risks seeming somewhat romantic alongside Malabou’s characterization of trauma as “*affective barrenness*,”³⁴ and there is surely more to be done to develop Stiegler’s theory of general organology alongside the neuroscience of aesthetic experience. From his writing to date, it is not yet clear, for example, how the prosthetic organization of our synaptic circuits fits with the neurobiology of affect and the de- and refunctionalization of the pleasure center of the brain. We can find some pointers, though, in recent experimental evidence, according to which “the making and

breaking of neuronal connections stimulates the expression of neurotransmitters strongly associated with pleasure in ways that no doubt affect aesthetic experiences.”³⁵ Research suggests that the repetition-inducing release of dopamine coincides with the recollection of favorably remembered sensory stimuli, causing us to crave their return. As the frequency of this return sees exception give way to stereotypical rule, tolerance to the hormone increases and the pleasure felt diminishes. And when the affective returns on these stereotypes become minimal (say, with symptoms of addiction), the transgression of our acquired habits provides a different kind of redemption. We move from the comfortable gratification of prevailing cultural tastes to the unsettling, complex and potentially intolerable, traumatypical, experience of liberation that Roland Barthes identifies with “the destruction of that culture.”³⁶ For Barthes, the work of art consists in the balancing of these two kinds of pleasure, with the familiar, identifiable *plaisir* offsetting the traumatic excesses of *jouissance*. This anticipates what neuroscience describes as the (culturally variable) play of harmony and dissonance³⁷ —and perhaps also what, thorough Stiegler, we might conceive as a sublimation, or deferral, of trauma, a *différance* of the past we inherit through technics.

Stiegler’s post-Darwinism

Work in the nascent field of evolutionary aesthetics tends to subordinate ideas of the cultural conditioning of aesthetic experience to an emphasis on the evolved biological role of beauty in both natural and sexual selection. Insofar as technical objects have been noticed, interest in them is geared less toward their role in the transformation of their users and their users’ environments than toward their status

as “fitness signals,” meaning markers of highly adaptive skillsets valued by potential mates for their contribution to the survival of future progeny.³⁸ The role of the work of art, in other words, is deemed subordinate to what it tells us about the adaptive fitness of its maker. Other notable ideas in evolutionary aesthetics emphasize the function of narrative in communicating valuable Darwinian lessons, identifying stories and art, not to mention the pleasure they occasion, as ways of internalizing the acquired experience of our ancestors, through whose recalled adventures we can vicariously rehearse strategies of mating and survival.³⁹ This line of thought clearly accords some significance to the inheritance of cultural memory, though its focus remains on gene-culture coevolution and a narrowly construed facilitation of the preservation of life. Other theories of aesthetic experience create more of an opening for Stiegler’s account of epiphylogenesis and the genealogy of the sensible, the re- and de-functionalization of our biological sensory architecture by technics, and the continued reinvention of the field of experience that this entails. Stephen Pinker reads the affective encounter with art in terms of a “non-adaptive exploitation of adaptive sources of pleasure,”⁴⁰ in which the artwork exapts, or refunctionalizes, biological processes that originally evolved for something else, the pleasure circuitry related to sex, for instance. It is nonetheless acknowledged within the field that evolutionary psychology has so far found little to tell us about the different kinds of pleasure linked to aesthetics⁴¹—which perhaps also explains why Stiegler’s interest in neuroscience has yet to inform his largely psychoanalytical account of the libidinal economy of desire.

Evolutionary biologists are routinely criticized for reducing aesthetics to biology,⁴² and, in a similar vein, it has been suggested that Stiegler collapses

aesthetics into technics, reducing the “critique of taste” to a discourse on prosthetics that fails to deal with questions of the criteria for the judgment of beauty.⁴³ But that is surely to miss his key insight, namely that the technics that recalibrate sensory experience also furnish the bases of aesthetic preference. Our internalization of the artificial codes of society mean that we are no longer confined to an appreciation of the adaptive traits formed by natural and sexual selection. Artificial selection creates criteria for judgment other than fitness, and accumulated cultural memory functions as a system of rules for interpretation, its organization of symbolic order providing the schematism—the stereo- and traumatypes—for the ways in which we read experience and adopt the tools that we inherit.

Elizabeth Grosz has made the case for aesthetics as an extension of sexual selection, a general economy of creativity that serves to “enhance the animal body and its surroundings” (2011: 132).⁴⁴ Building on Darwin and later Uexküll, she also argues that the biological architectures of different species preclude a homogenous, anthropocentric conception of aesthetics and technics.⁴⁵ The elaborate nests of the bowerbird and the twig-enhanced antlers of the red deer, far more than the flower-painting elephants of the Thai tourist trade, would be illustrative of this, pointing to the existence of artificial selection among non-human animals. But they also, and *pace* Grosz, reveal a logic of technics that falls short of epiphylogenesis, if only by degree. Non-human bodies can be de- and refunctionalized by technics, but that is not to say they participate in the construction of an aesthetic, symbolic order. Primatologists broadly accept, for example, that the tools of even our closest non-human relatives are reinvented from scratch with each generation. The termite-fishing rods of the bonobo are not

adopted as the products of cumulative and coordinated cultural learning in which the favored traces of the past are bequeathed to posterity; nor is their use characterized by the pedagogy, intergenerational transmission and social organization of enforced cultural norms found among members of the genus *Homo*.⁴⁶ They are thus not the bearers of an unconscious, ancestral history whose inheritance allows the envisioning of sublime and traumatic alternatives to strictly biological horizons of sensation. Our culturally-acquired ability to project new futures opens up the prospect of liberation from our inhumanity. Technics, in other words, enable us to be “not-inhuman”⁴⁷—a term that Stiegler employs in distinction to humanity, and which captures the memory of tragic histories that cannot simply be explained away by animality. If the human, or not-inhuman exists, it does so only “intermittently,” and consisting in a promise we glimpse in the mirror of art.

¹ Charles Darwin, *On the Origin of Species*, ed. Gillian Beer (Oxford: Oxford University Press, 2008), 98. The title of this article alludes to the full title of Darwin’s masterwork: *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*.

² Bernard Stiegler, “L’Être soigneux,” in *L’Avenir du passé: Modernité de l’archéologie*, ed. Jean-Paul Demoule and Bernard Stiegler (Paris: La Découverte, 2008), 22. All translations from French are the author’s own, unless otherwise specified.

³ Slavoj Žižek, “Lacan Between Cultural Studies and Cognitivism,” *Umbr(a): Science and Truth*, 1 (2000): 23; see also Christopher Johnson, *System and Writing in the Philosophy of Jacques Derrida* (Cambridge, Cambridge University Press, 1993), 164-7.

⁴ Bernard Stiegler, *De la misère symbolique, 2: La Catastrophe du sensible*

(Paris: Galilée, 2005), 62. Hereafter, this work is cited parenthetically as *MS2*.

⁵ See, for example, the pharmakon.fr seminar of 31 May, 2012, available online at: <http://pharmakon.fr/wordpress/seminaire-20112012-seance-n%C2%B05-31-mai-2012/> Last accessed July 4, 2014.

⁶ Bernard Stiegler, *Technics and Time, 1: The Fault of Epimetheus*, trans.

Richard Beardsworth (Stanford: Stanford University Press, 1998), 178; *La*

Technique et le temps, 1: La Faute d'Épiméthée (Paris: Galilée, 1994), 186.

Hereafter, this work is cited parenthetically as *TT1*, with page references given for both the English and French editions.

⁷ Bernard Stiegler, *The Decadence of Industrial Democracies: Disbelief and Discredit, 1*, trans. Daniel Ross and Suzanne Arnold (Cambridge: Polity, 2011), 142; *Mécréance et discredit, 1: La Décadence des démocraties industrielles* (Paris: Galilée), 188.

⁸ St. George Jackson Mivart, *On the Genesis of Species* (London: MacMillan, 1871), 26.

⁹ Stephen Jay Gould, "Not Necessarily a Wing," in *The Richness of Life* (London: Virago, 2007), 157.

¹⁰ Darwin, *On the Origin of Species*, 143.

¹¹ Friedrich Nietzsche, *The Genealogy of Morality*, ed. Keith Ansell-Pearson, trans. Carol Diethe (Cambridge: Cambridge University Press, 1994), 51-2 (second essay, §12).

¹² Gould, 'Not Necessarily a Wing', 148; see also Stephen Jay Gould, "Exaptation: A Crucial Tool for an Evolutionary Psychology," *Journal of Social Issues*, 47.3 (1991): 43-65.

¹³ See also Karl Marx, *Capital*, volume 1, trans. Ben Fowkes (Harmondsworth: Penguin, 1990), 91.

¹⁴ Jacques Derrida, "Freud and the Scene of Writing," in *Writing and Difference*, trans. Alan Bass (London: Routledge, 2001), 247; *L'Écriture et la différence* (Paris: Seuil, 1967), 294; see also Jacques Derrida, *Of Grammatology*, trans. Gayatri Chakravorty Spivak (Baltimore: Johns Hopkins University Press, 1997), 65, 130, 167; *De la grammatologie* (Paris: Minuit, 1967), 95, 190, 238.

¹⁵ Bernard Stiegler, *Pharmacologie du Front National* (Paris: Flammarion, 2013), 290. See also Gilles Deleuze, *Logic of Sense*, trans. Constantin V. Boundas, Mark Lester and Charles Stivale (London: Continuum, 2004), 9-10, 108-9; *Logique du sens* (Paris: Minuit, 1969), 15, 18, 115-16.

¹⁶ Stiegler, "L'Être soigneux," 22; see also: Stiegler, *The Decadence of Industrial Democracies*, 89-90; *Mécréance et discredit*, 1, 125.

¹⁷ André Leroi-Gourhan, *Gesture and Speech*, trans. Anna Bostock Berger (Cambridge: The MIT Press, 1993), 117; *Le Geste et la parole, 1: Technique et langage* (Paris: Albin Michel, 1964), 168. The English translation also includes the second volume, *Le Geste et la parole, 2: La Mémoire et les rythmes* (Paris: Albin Michel, 1964). Hereafter, this work is cited parenthetically as *GS1* or *GS2*, with dual page references referring to the (single) English edition and either the first of second volume of the French.

¹⁸ Kim Sterelny, *The Evolved Apprentice: How Evolution Made Humans Unique* (Cambridge: The MIT Press, 2012), 26, 33.

¹⁹ Stiegler, "L'Être soigneux," 22.

²⁰ On this point, see Ian James, "Technics and Cerebrality," in *Stiegler and Technics*, ed. Christina Howells and Gerald Moore (Edinburgh: Edinburgh University Press, 2013), 69-84.

²¹ Stiegler, *Pharmacologie du Front National*, 126-7; see also Maryanne Wolf, *Proust and the Squid: The Story and Science of the Reading Brain* (London: Icon, 2008) and Stanislas Dehaene, *Reading in the Brain: The New Science of How We Read* (London: Penguin, 2009).

²² Joseph LeDoux, *The Synaptic Self: How Our Brains Became Who We Are*. (Harmondsworth: Penguin, 2002), 8.

²³ Merlin Donald, *Origins of the Modern Mind* (Cambridge: Harvard University Press, 1991), 13-14.

²⁴ Catherine Malabou, *The New Wounded: From Neurosis to Brain Damage*, trans. Steven Miller. (New York: Fordham University Press), 157; *Les Nouveaux Blessés. De Freud à la neurologie, penser les traumatismes contemporains*. (Paris: Bayard, 2007), 261-2.

²⁵ Darwin, *On the Origin of Species*, 8.

²⁶ Sigmund Freud, "Moses and Monotheism: Three Essays," in *The Origins of Religion*, Penguin Freud Library, vol. 13, trans. and ed. James Strachey (Harmondsworth: Penguin, 1990), 343. The go-to criticism for this aspect of Freud is Stephen Jay Gould, "Freud's Evolutionary Fantasy," in *The Richness of Life*, 467-79.

²⁷ Sigmund Freud, *The Complete Letters of Sigmund Freud to Wilhelm Fliess, 1887-1904*, trans. and ed. Jeffrey Moussaieff Masson (Cambridge: Belknap/Harvard University Press, 1985), 279.

²⁸ Sigmund Freud, "Civilization and Its Discontents," in *Civilization, Society and Religion*, Penguin Freud Library, vol. 11, trans. and ed. James Strachey (Harmondsworth: Penguin, 1990), 288-9n.1; see also Stiegler, *De la misère symbolique*, 2, 200-3.

²⁹ Charles Darwin, *The Descent of Man, and Selection in Relation to Sex* (Harmondsworth: Penguin Classics, 2004), 640.

³⁰ Darwin, *The Descent of Man*, 641, 649; Darwin, *On the Origin of Species*, 84.

³¹ Darwin, *The Descent of Man*, 648.

³² Friedrich Nietzsche, "Truth and Lie in an Extra-Moral Sense," in *The Portable Nietzsche*, ed. and trans. Walter Kaufmann (Penguin: Harmondsworth, 1976), 47.

³³ See Edmund Husserl, *On the Phenomenology of the Consciousness of Internal Time* (1893-1917), trans. John Barnett Brough. (Dordrecht: Kluwer, 1991), 47-9 (§19); for a discussion of how this is taken up by Stiegler, see Daniel Ross, "Pharmacology and Critique after Deconstruction," in Howells and Moore, *Stiegler and Technics*.

³⁴ Malabou, *The New Wounded*, 157; *Les Nouveaux Blessés*, 262.

³⁵ Paul B. Armstrong, *How Literature Plays with the Brain: The Neuroscience of Reading and Art* (Baltimore: Johns Hopkins University Press, 2013), 50. In making this claim, Armstrong cautiously refers to David J. Linden, *The Compass of Pleasure* (Harmondsworth: Penguin, 2012), 15-20.

³⁶ Roland Barthes, *The Pleasure of the Text*, trans Richard Miller (New York: Hill and Wang, 1975), 14; *Le Plaisir du texte* (Paris: Seuil, 1973), 25-6.

³⁷ Armstrong, *How Literature Plays with the Brain*, 14-15.

³⁸ Denis Dutton, *The Art Instinct* (Oxford: Oxford University Press, 2009), 146-7.

³⁹ John Tooby and Leda Cosmides, "Does Beauty Build Adapted Minds? Toward an Evolutionary Theory of Aesthetics, Fiction and the Arts," *SubStance*, 94-5 (2001): 6-27

⁴⁰ Joseph Carroll, "Steven Pinker's Cheesecake For The Mind," *Philosophy and Literature*, 22 (1998): 478-85.

http://cogweb.ucla.edu/Abstracts/Carroll_C98.html Last accessed: July 4, 2014.

See also Stephen Pinker, *How the Mind Works* (Harmondsworth: Penguin, 1997), 525, 534.

⁴¹ Dennis Dutton, "Aesthetics and Evolutionary Psychology," in *The Oxford Handbook of Aesthetics*, ed. Jerrold Levinson (Oxford: Oxford University Press, 2002), 703.

⁴² See, for example, Armstrong, *How Literature Plays with the Brain*, preface.

⁴³ Serge Trottein, "Technics, or the Fading Away of Aesthetics," in Howells and Moore, *Stiegler and Technics*, 93.

⁴⁴ Elizabeth Grosz, *Becoming Undone: Darwinian Reflections on Life, Politics and Art* (Durham: Duke University Press, 2011), 132.

⁴⁵ Grosz, *Becoming Undone*, 22-3.

⁴⁶ See Michael Tomasello, *A Natural History of Human Thinking* (Cambridge: Harvard University Press, 2014), 80-4; also King, *Origins of the Modern Mind*, 125-6.

⁴⁷ See, most notably, Bernard Stiegler, *Taking Care of Youth and the Generations*, trans. Stephen Barker (Stanford: Stanford University Press, 2010), 170; *Prendre soin: De la jeunesse et des generations* (Paris: Flammarion, 2008), 303-4.